

## Examples of Undergraduate One Health Education

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While many “One-Health” courses exist within our veterinary and graduate schools, few programs exist within undergraduate pre-health curricula. Historical reports credit the earlier days of the medical professions with having a minimal gap between the medical and veterinary professions. This minimal gap still exists today within our undergraduate, pre-health programs. We should take this opportunity to connect and educate health professionals at an “early age”, when they are naturally learning together. As undergraduates, these students are excited about integrating new ideas, and their academic schedule may be more accommodating to a variety of classes. Presenting One-Health concepts to students at this stage of their education could have a positive impact on their awareness and attitudes toward public health and zoonotic disease.

At Grove City College, Grove City, PA, we have developed a special topics course within the biology department, “Zoonosis and Public Health”. The biology department at Grove City has a strong pre-health enrollment with the majority of our department’s graduates moving on to some sort of health graduate program. The course focuses on common zoonoses and teaches students about the basic epidemiology and pathophysiology of selected diseases. This course also creates an awareness of the relationships that exist between the humans, animals and the environment, which is often lost to urban or suburban students. Laboratory sessions include field trips to local areas of public health interest, as well as guest speakers from the community. Some examples would include; a visit to the local sewage plant, a trip to a biomedical research building, a presentation from a global medical supply charity, and a lecture from our state veterinarian. With the help of corporate donations, we were also able to learn about tick-borne diseases while helping the local humane society with shelter testing. The students also get involved by choosing a common zoonosis, researching the disease, and developing oral presentations for their peers.

Other examples of One Health educational opportunities at Grove City College include a faculty led student travel course to the Crow Indian Reservation in Montana and a faculty supervised, student research project involving ticks and tick-borne diseases. Each of these experiences allow students to work and serve with a community of people and various health professionals to investigate health challenges that involve people, animals, and the environment.

The Crow travel course focuses on various aspects of public health and includes exposure to the culture, environment, and history of the Apsaalooke people and their lands. The course includes a week of classes held at the College followed by a trip to the Crow Reservation in Montana. Once in Montana, students participate in group and/or specific students-designed public health projects (Rabies clinics, West Nile clinics, gardening, nutrition, and other public health seminars). We work with prominent members of the tribe, the Little Big Horn College, and the Crow Indian Hospital in the development and implementation of these projects.

Our student research study, *A Collaborative Investigation of Current Tick Species and the Prevalence of Selected Tick-borne Zoonotic Diseases within these Ticks throughout Pennsylvania, 2013-2015*, involved collaboration with the Pennsylvania Game Commission, The Pennsylvania Department of Health, and The Pennsylvania Department of Agriculture to collect nearly 3000 ticks across the state of Pennsylvania. Three tick specimen collections, originating from state-wide, hunter harvested, deer check stations,

occurred from 2013, 2014, and 2015. The ticks were sorted, speciated, sexed, and staged. Then *Ixodes scapularis* ticks were PCR tested for five common tick-borne pathogens. Data analysis and the development of a report are currently underway. This experience has provided many real world experiences in working with various health professionals to investigate disease concerns that incorporate people, animals and the environment, One Health.

The College, administration, and faculty must be credited for being willing to support development and delivery of these original courses. They have proven to be a practical fit within the curriculum, as they are positioned to attract junior/senior students who are in the process of applying to professional schools. Having developed and delivered these courses, I personally have observed how popular they are with pre-health students, as shown by student evaluations and enrollment.

All colleges and universities with large numbers of pre-health students should consider the addition of One-Health courses to enrich their curricula. By expanding our scope within the earlier stages of health professionals' education, we will be more effective in shaping all future health providers, educators and introducing One Health to the general public.